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審査請求　未請求

(全　頁)

(54) 高周波同軸接続体

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明　細　書

1. 考案の名称

高周波同軸接続体

2. 実用新案登録請求の範囲

同軸ケーブルが接続されるストップ線路形式のマイクロ波回路基板の入出力端部において、前記接続のコネクタは該コネクタ中心導体の延長線上基板表面に楔状誘電体が付設されて前記線路周辺への電磁放射を無くしたことを特徴とする高周波同軸接続体。

3. 考案の詳細な説明

(a) 考案の技術分野

本考案は同軸ケーブルとストリップ線路との接続に係る高周波同軸接続体に関す。

(b) 技術の背景

ギガヘルツ帯高周波伝送線路は、線路の曲りやあるいは線路の急峻な寸法変化により反射や放射が起り、このため隣接の構成回路と電磁的干渉が出やすく、又伝送信号の歪が発生したりする。

本考案は係る伝送線路において同軸コネクタを

介して例えば５０オームの同軸ケーブルと絶縁基板上形成のマイクロ波ストリップ線路との接続部で、前記線路端から発生の電磁エネルギ放射を極小に抑止しうる構成手段を提示するものである。

(c) 従来技術と問題点

第１図は従来の前記同軸ケーブルとストリップ線路との接続構成を示す断面図である。

図において、１は同軸コネクタ、２はストリップ線路側の金属筐体であって、該線路の接地導体を兼ねる。前記同軸コネクタ１は筐体２端面に螺着され、図示３は１の螺着フランジ、及び４と５は夫々線路形成の絶縁基板と該基板上に形成の薄膜導体いわゆるストリップ線路である。尚、又６は１の中心導体であって前記接地導体２に螺着のフランジ側とは絶縁環７を介して固定される。

しかして、同軸コネクタ１は雌構成の中心導体６を具えて図示されない同軸ケーブル端装着の雄構成同軸コネクタと嵌入接続されるにより、前記ストリップ線路５は同軸ケーブルと接続される。

ところで、通常中心導体６は右端８の部処でス

トリップ線路5と半田付け接続される電気的導通がとられる。しかし、該接続端8では急峻な寸法上の変化をともなうため、伝送のマイクロ波は電磁エネルギを空間放射し損失となる。

更に、又かかる線路の入出力端露出部においては近接して設けられた信号処理回路からの洩漏マイクロ波と電磁的に結合して伝送信号の歪を発生し好ましくない。

(d) 考案の目的

本考案の目的は、前記の不都合を解消する接続構成手段を提示するにある。

(e) 考案の構成

前記目的達成のため、本考案によればストリップ線路接続の同軸コネクタは該コネクタ中心導体の延長線上基板表面に楔状誘電体が付設されることにより、ストリップ線路周辺への電磁放射を無くしたものである。

(f) 考案の実施例

以下、第1図の前記従来接続構成断面図、及び第1図の基板表面斜視図を示す第2図に従がって

本考案を説明する。

斜視図において、同軸コネクタ1装着になるストリップ線路形成面には本考案の楔状誘電体9が設けられる。該誘電体は前記中心導体の接続端子の中心導体6，接続部8を上方から被覆し、その下方のストリップ線路形成面10は例えば接着剤で安定に固定される。

楔状誘電体9は同軸コネクタ中心導体の絶縁環7の高さより若干高いフランジ側接触端面11を有し、該端面から離れるにしたがい、即ち、中心導体の延長方向にその高さがなだらかに減少する例図の如き勾配が付される。

楔状誘電体9として例えばポリ四弗化エチレン，又は弗化エチレンプロピレン共重合体等の弗素樹脂を用いれば誘電損失も少く、かつ耐熱性の優れた被覆を形成することが出来る。

しかしながら、前記樹脂体はいずれも誘電率が小さい、このため樹脂中に高誘電率の粉末体例えばセラミック誘電粉末を分散せしめて硬化させることも有効である。

(g) 考案の効果

前記本考案の高周波同軸接続体構成とすることにより、従来、接続端子部で生起する電磁放射や又電磁放射にもとづく電磁的干渉がなくなり、との種マイクロ波伝送線路における伝送特性がよくなる等の利点がある。

4. 図面の簡単な説明

第1図は従来の同軸線路接続構成を示す断面図、第2図は本考案の一実施例を示す同軸接続体斜視図である。

図中、1は同軸コネクタ、3は1のフランジ、4はストリップ線路5形成の基板、6は中心導体、9は楔状誘電体である。

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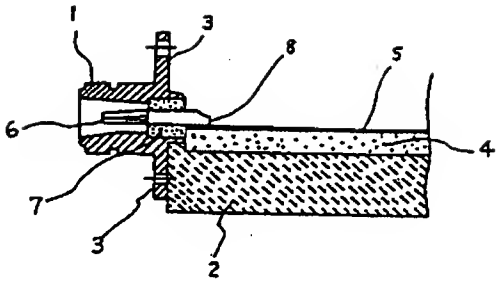
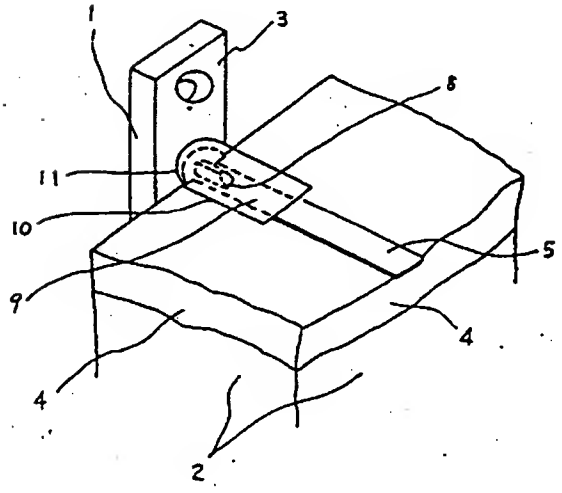
第 1 図



prior art

第 2 図



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実開59-4189

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REFERENCE NO. 2

Japanese Utility Model Registration
Early Disclosure No. 59-4189

Reference No. 2

HIGH FREQUENCY COAXIAL CONNECTOR

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(12) EARLY DISCLOSURE UTILITY MODEL REGISTRATION GAZETTE (U)

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Request for Examination Not requested

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(54) Title of Device: High frequency coaxial connector

(21) Registration Application No.: 57-98873

(22) Application Date: 30 June 1982

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SPECIFICATION

1. Title of the Device

High frequency coaxial connector

2. Scope of Utility Model Registration Claims

A high frequency coaxial connector at the input and output terminals of strip-wired microwave circuit boards to which coaxial cable is connected which is characterized by the connector for the aforementioned connection having a wedge-shaped dielectric mounted on the substrate surface and over the extension lead from the center conductor of the said connector so as to eliminate any electromagnetic radiation to the aforementioned surrounding wiring.

3. Detailed Explanation of the Device

(a) Technological field of the device

This device pertains to a high frequency coaxial connector that is related with the connection of coaxial cable to strip wiring.

(b) Technological background

Reflection and radiation occur in gigahertz band high frequency transmission circuits due to bends and sudden dimensional changes in the wiring and therefore easily produce electromagnetic interference with nearby structural circuits or generate distortion in the transmission signal.

A structural means is provided through the coaxial connector for transmission circuits related to this device for minimizing the radiation of electromagnetic energy generated from the line terminus in connectors between, e.g., 50 Ω coaxial cable and

microwave strip wiring formed on an insulating substrate.

(c) Problems of past technology

Figure 1 is a cross sectional drawing showing a past example of the aforementioned connector structure between a coaxial cable and strip wiring.

In the figure, 1 is the coaxial connector and 2 is the metal frame on the strip wiring side, which also serves as the ground conductor for the said wiring. 3 in the figure is the screw flange for 1 and 4 and 5 are, respectively, the insulating substrate for wiring formation and the thin film conductor, or so-called strip wiring, that is formed on the said substrate. Now, 6 is the center conductor of 1, which is attached to the screw flange, and hence to the aforementioned ground conductor 2, via an insulating ring 7.

Thus, a coaxial cable can be connected to the aforementioned strip wiring 5 by inserting and connecting the male coaxial connector connected to the aforementioned coaxial cable (not shown) to the female center conductor 6 of the coaxial connector 1.

Incidentally, the center conductor 6 is normally soldered, and hence electrically conductively connected, at its right end 8 to the strip wiring 5. However, since there is a drastic dimensional change at this connection end 8, the microwaves being transmitted radiate electromagnetic energy into space, which causes a loss.

Furthermore, the exposed parts of the input/output terminals of this wiring become electromagnetically engaged with the

microwaves leaking from adjacently mounted signal processing circuits, causing distortion in the transmission signals, which is undesirable.

(d) Objective of the device

The objective of this device is to provide a structural connecting means that will resolve the aforementioned inconveniences.

(e) Structure of the device

In order to achieve the aforementioned objective, electromagnetic radiation to surrounding strip wiring is eliminated in coaxial connectors for connecting strip wiring through this device by mounting a wedge-shaped dielectric on the substrate surface and over the extension lead of the center conductor of the said connector.

(f) Example implementation of the device

This device will be explained below using the aforementioned past connection structure cross section in Figure 1 and Figure 2, which shows an oblique view of the substrate surface in Figure 1.

In the oblique view drawing, the wedge-shaped dielectric 9 of this device is mounted on the surface on which the strip wiring, that is the mounting for the coaxial connector 1, is formed. The top of this dielectric covers the center conductor 6 and its connection point 8 at the connection terminal of the aforementioned center conductor, while its bottom is securely fastened with, e.g., adhesive to the strip wire formation surface 10.

The wedge-shaped dielectric 9 has an end face 11 that is

connected to the flange and which is slightly taller than the height of the insulating ring 7 of the center conductor of the coaxial connector, and its height gradually diminishes and slopes, as shown in the figure, as it moves away from that end face 11, i.e., in the direction of the center conductor extension.

A covering of low dielectric loss and excellent heat resistance can be formed if a fluorine resin, e.g., polyethylene tetrafluoride or ethylene fluoride-propylene copolymer, is used as the wedge-shaped dielectric 9.

However, both of the aforementioned resins have low dielectric constants. It would therefore be effective to cure the resin with a high-permittivity powder, e.g., ceramic dielectric powder, dispersed in it.

(g) Effect of the device

Using the aforementioned high frequency coaxial connector structure of this device has the advantages of eliminating the electromagnetic radiation generated by past connector terminals, as well as the electromagnetic interference that is based on this electromagnetic radiation, thereby improving the transmission characteristics in this type of microwave transmission wiring.

4. Brief Explanation of the Figures

Figure 1 is a cross sectional drawing showing a conventional coaxial circuit connection structure and Figure 2 is an oblique view drawing showing an example implementation of this device.

In the figures, 1 is the coaxial connector, 3 is the flange of 1, 4 is the substrate on which the strip wiring 5 is formed, 6

is the center conductor and 9 is the wedge-shaped dielectric.

Agent Koshiro OKAYAMA, Patent Attorney

Figure 1

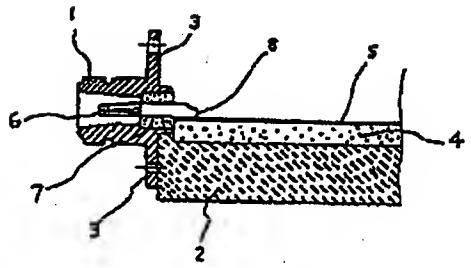
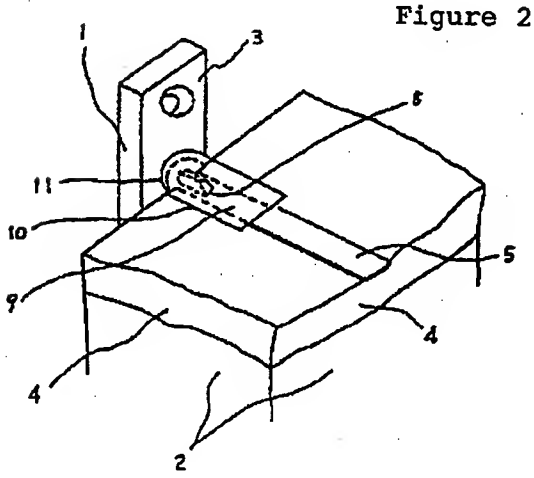


Figure 2



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